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10/667,207	09/18/2003	Gregory C. Burnett	ALPH.P010X	7159

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EXAMINER	
LAO, LUN S	

ART UNIT	PAPER NUMBER
2615	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

BCOURTNEY@CSGIP.COM

Office Action Summary	Application No.	Applicant(s)	
	10/667,207	BURNETT ET AL.	
	Examiner	Art Unit	
	LUN-SEE LAO	2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 April 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,6-13,15-17,21,22,26-41,45 and 46* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3, 6-13, 15-17, 21-22, 26-41 and 45-46* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Introduction

1. This communication is responsive to the amendment filed on 04-17-2008. Claims 1-3, 6, 8, 9, 12, 13, 16, 21, 22, 26, 27, 31-33, 35, 36, 39, and 40 are have been amended herein. Claims 4, 5, 14, 18-20, 23- 25, and 42-44 have canceled ; and claims 45 and 46 have been added. Claims 1-3, 6-13, 15-17, 21-22, 26-41 and 45-46 are pending.

Continued Examination Under 37 CFR 1.114

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 04-17-2008 has been entered.

Drawings

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, generating at least one transfer function representative of a ratio of energy of the acoustic signal received using at least two different acoustic microphones of the at least two acoustic microphones when the VAD indicates that user voicing activity is absent; and removing acoustic

noise from at least one of the acoustic signals by applying the transfer function to the acoustic signals and generating denoised acoustics signals must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

4. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, a processor coupled among two microphones and at least one voicing sensor, wherein the at least one voicing sensor detects human tissue vibration associated with voicing activity of a user,

wherein an absence of voiced information voicing activity is detected during a period using the at least one voicing sensor, wherein at least one acoustic noise source signal is received during the period using the two microphones, wherein the processor generates a transfer function representative of a ratio of acoustic energy received by the two microphones during the period, wherein the microphones receive composite signals comprising acoustic signals and acoustic noise signals, and the processor removes the acoustic noise must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claim 35 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 35 recited limitation "a signal processing system coupled among a user and an electronic device, wherein the signal processing system includes a denoising subsystem for removing acoustic noise from acoustic signals, the denoising subsystem comprising a processor coupled among a receiver and at least one sensor, wherein the receiver is coupled to receive at the acoustic signals via at least two microphones, wherein the at least one sensor detects human tissue vibration associated with human voicing activity of a user, wherein the processor generates a plurality of transfer functions, wherein a first transfer function representative of the a ratio of acoustic energy received by the two microphones is generated in response to a determination that voicing activity is absent from the acoustic signals for one a specified period of time, wherein acoustic noise is removed from the acoustic signals using the first transfer function to produce a denoised acoustic data stream" However the specification does not clearly disclose how the processing of such

"wherein the processor generates a plurality of transfer functions, wherein a first transfer function representative of the a ratio of acoustic energy received by the two microphones is generated in response to a determination that voicing activity is absent from the acoustic signals for one a specified period of time, wherein acoustic noise is removed from the acoustic signals using the first transfer function to produce a denoised acoustic data stream" will be performed. It was not supported in the specification and any figures nor in any claim originary.

7. Claims 31 and 45-46 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 31 recited limitation " the system comprising: dividing acoustic data of the acoustic signals into a plurality of subbands; generating a transfer function representative of the ratio of acoustic energies received in each microphone in each subband; removing acoustic noise from each of the plurality of subbands using a transfer function, wherein a plurality of denoised acoustic data streams are generated; and combining the plurality of denoised acoustic data streams to generate the denoised acoustic data stream" However the specification does not clearly disclose how the processing of such " generating a transfer function representative of the ratio of acoustic energies received in each microphone in each

subband" will be performed. It was not supported in the specification and any figures nor in any claim originary.

Consider claims 45-46, they are essentially similar to claim 31 and are rejected for the reason stated above apropos to claim 31.

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 2, 27 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 2 recites "generating at least one second transfer function representative of the a ratio of energy of the acoustic signal received when the VAD indicates that user voice activity is present", which is unclear to the examiner what is first transfer function referring to.

Consider claim 27 it is essentially similar to claim 2 and is rejected for the reason stated above apropos to claim 2.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. Claims 1-3, 6-13, 15-17, 21-22, 26-30 and 32-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshida et al (US PAT. 5,473,702) in view of Holzrichter (US PAT. 5,729,694).

Consider claim 1 Yoshida teaches a method for removing noise from acoustic signals, comprising:

receiving at least two acoustic signals using at least two acoustic microphones positioned in a plurality of locations(see fig.4 (1,2));

generating a voice activity detection (VAD) signal using the voice activity signal(see fig.4 (300), fig.5 (400)) and fig.8);

generating at least one transfer function representative of a ratio of energy of the acoustic signal received using at least two different acoustic microphones of the at least two acoustic microphones(1,2) when the VAD (see fig.8) indicates that user voicing activity is absent (see col. 11 line 50-col. 12 line 12); and

removing acoustic noise from at least one of the acoustic signals by applying the transfer function to the acoustic signals and generating denoised acoustics signals(see fig.1 and see col. 7 line 59-64 and col. 8 line 1-col. 9 line 67); but Yoshida does not explicitly teach receiving a voice activity signal that includes information on vibration of human tissue associated with human voicing activity of a user.

However, Holzrichter teaches receiving a voice activity signal that includes information on vibration of human tissue associated with human voicing activity of a user(see fig. 5 (43) and see col. 15 line 29-col. 16 line 3 and col. 60 line 19-30)

Therefore, it would have obvious to one of ordinary skill in the art the time the invention was made to combine the teaching of Holizrichter into Yoshida to produce more accurate speech coding.

Consider claims 2-3 Yoshida teaches removing noise further comprises: generating at least one second transfer function representative of the a ratio of energy of the acoustic signal received when the VAD indicates that user voice activity(see fig.4 (300)) is present; and removing noise from the of acoustic signals using at least one combination of the at least one transfer function and the at least one second transfer function to generate the denoised acoustic signals (see figs.4-5 and 8 and see col. 7 line 59-64, col. 7 line 59-64 and col. 8 line 1-col. 9 line 67, col. 11 line 50-col. 12 line 12); and the of acoustic signals include at least one reflection of at least one associated noise source signal and at least one reflection of at least one acoustic source signal (see fig. 4 and see col. 7 line 59-64, col. 7 line 59-64).

Consider claims 6-8 Yoshida teaches the method wherein generating the at least one transfer function comprises recalculating the at least one transfer function during at least one prespecified interval (see fig. 4 and col. 8 line 1-col. 9 line 67); and wherein generating the at least one second transfer function comprises recalculating the at least one second transfer function during at least one prespecified interval(see fig. 4 and col. 8 line 1-col. 9 line 67); and wherein generating the at least one f-~ transfer function

comprises use of at least one technique selected from a group consisting of adaptive techniques and recursive techniques (see fig. 4 and col. 8 line 1-col. 9 line 67).

Consider claims 21-22, they are essentially similar to claims 7-8 and are rejected for the reason stated above apropos to claims 7-8.

Consider claims 9-11, Yoshida as modified by Holzrichter teaches that the method of information on the vibration of human tissue is provided by a sensor (in Holzrichter such as, motion sensor) in contact with the skin (in Holzrichter see figs 3a-3b(29,30,33)) and see col. 14 line 46-col. 15 line 18); and the method of information on the vibration of human tissue is provided via at least one sensor selected from among at least one of an accelerometer, a skin surface microphone in physical contact with skin of a user, a human tissue vibration detector, a radio frequency (R.F) vibration detector, and a laser vibration detector(in Holzrichter see figs 3a-3b(29,30,33) and see col. 14 line 46-col. 15 line 18); and the human tissue is at least one of on a surface of a head, near the surface of the head, on a surface of a neck, near the surface of the neck, on a surface of a chest, and near the surface of the chest(in Holzrichter see figs 3a-3b(29,30,33)) and see col. 14 line 46-col. 15 line 18).

Consider claim 16, it is essentially similar to claim 9 and are rejected for the reason stated above apropos to claim 9.

Consider claim 17, it is essentially similar to claim 10 and are rejected for the reason stated above apropos to claim 10.

Consider claim 15 it is essentially similar to claim 11 and is rejected for the reason stated above apropos to claim 11.

Consider claim 12 Yoshida teaches a method for removing noise from acoustic signals, comprising:

receiving two acoustic signals using two directional acoustic microphones positioned in two locations(see fig.4 (1, 2));

generating a voice activity detection (VAD) signal using the voice activity signal(see fig.4 (300), fig.5 (400)) and fig.8);

generating at a transfer function representative of the ratio of energy of the acoustic signal received using the two acoustic microphones (1, 2) when the VAD (see fig.8) indicates that user voicing activity is absent(see col. 11 line 50-col. 12 line 12); and

removing acoustic noise from the acoustic signal of one of the microphones by applying the transfer function to the acoustic signal from that microphone and generating a denoised acoustic signal(see fig.4 and see col. 7 line 59-64 and col. 8 line 1-col. 9 line 67); but Yoshida does not explicitly teach receiving a voice activity signal that includes information on vibration of human tissue associated with human voicing activity of a user.

However, Holzrichter teaches receiving a voice activity signal that includes information on vibration of human tissue associated with human voicing activity of a user(see fig. 5 (43) and see col. 15 line 29-col. 16 line 3 and col. 60 line 19-30)

Therefore, it would have obvious to one of ordinary skill in the art the time the invention was made to combine the teaching of Holizrichter into Yoshida to produce more accurate speech coding.

Consider claim 13 Yoshida teaches the at least one acoustic noise source signal includes at least one reflection of at least one associated acoustic noise source signal (see fig. 4 and col. 8 line 1-col. 9 line 67).

Consider claim 26 Yoshida teaches a system for removing acoustic noise from the acoustic signals, comprising:

a receiver that receives at least two acoustic signals via at least two acoustic microphones positioned in a plurality of locations (see fig.4 (1, 2));

at least one sensor that receives human tissue vibration information associated with human voicing activity of a user (see fig.4);

a processor (see fig. 4 (300)) coupled among the receiver and the at least one sensor that generates a plurality of transfer functions, wherein a first transfer function representative of the a ratio of energy of acoustic signals received using at least two different acoustic microphones of the at least two acoustic microphones (1,2) is generated in response to a determination that voicing is absent from the acoustic signals for a period of time, wherein acoustic noise is removed from the acoustic signals using the first transfer function to produce a denoised acoustic data stream streams (see figs.4-5 and 8 and see col. 7 line 59-64, col. 7 line 59-64 and col. 8 line 1-col. 9 line 67, col. 11 line 50-col. 12 line 12); but Yoshida does not explicitly teach receiving a voice activity signal that includes information on vibration of human tissue associated with human voicing activity of a user.

However, Holzrichter teaches receiving a voice activity signal that includes information on vibration of human tissue associated with human voicing activity of a user(see fig. 5 (43) and see col. 15 line 29-col. 16 line 3 and col. 60 line 19-30)

Therefore, it would have obvious to one of ordinary skill in the art the time the invention was made to combine the teaching of Holizrichter into Yoshida to produce more accurate speech coding.

Consider claim 27 as base on 112 second paragraph problem state above, Yoshida teaches the system wherein a second transfer function representative of the acoustic signals is generated in response to a determination that voicing information activity is present in the acoustic signals for the period of time, wherein acoustic noise is removed from the acoustic signal signals using at least one combination of the at least one first transfer function and the second transfer function to produce the denoised acoustic data stream(see figs.4-5 and 8 and see col. 7 line 59-64, col. 7 line 59-64 and col. 8 line 1-col. 9 line 67, col. 11 line 50-col. 12 line 12).

Consider claim 28 Yoshida as modified by Holzrichter teaches that the sensor includes a mechanical sensor (such as, motion sensor) in contact with the skin (In Holzrichter see figs 3a-3b(29,30,33)) and see col. 14 line 46-col. 15 line 18);

Consider claim 29 Yoshida as modified by Holzrichter teaches at least one sensor selected from among at least one of an accelerometer, a skin surface microphone in physical contact with skin of a user, a human tissue vibration detector, a radio frequency (R.F) vibration detector, and a laser vibration detector(in Holzrichter, see figs 3a-3b(29,30,33) and see col. 14 line 46-col. 15 line 18);

Consider claim 30 Yoshida as modified by Holzrichter teaches at least one of on a surface of a head, near the surface of the head, on a surface of a neck, near the surface of the neck, on a surface of a chest, and near the surface of the chest(In Holzrichter see figs 3a-3b(29,30,33)) and see col. 14 line 46-col. 15 line 18).

Consider claims 34, 38 and 41, they are essentially similar to claim 30 and are rejected for the reason stated above apropos to claim 30.

Consider claim 32 Yoshida teaches the system wherein the receiver includes a plurality of independently located microphones(see fig.4).

Consider claim 33 Yoshida teaches a system for removing acoustic noise from acoustic signals, comprising a processor (see fig.4 (300, 20)) coupled among two microphones (1,2), wherein at least one acoustic noise source signal is received during the period using the two microphones (1,2), wherein the processor generates a transfer function representative of a ratio of acoustic energy received by the two microphones during the period, wherein the microphones receive composite signals comprising acoustic signals and acoustic noise signals, and the processor removes the acoustic noise(see figs.4-5 and 8 and see col. 7 line 59-64, col. 7 line 59-64 and col. 8 line 1-col. 9 line 67, col. 11 line 50-col. 12 line 12); but Yoshida does not explicitly teach at least one voicing sensor, wherein the at least one voicing sensor detects human tissue vibration associated with voicing activity of a user wherein an absence of voiced information voicing activity is detected during a period using the at least one voicing sensor.

However, Holzrichter teaches at least one voicing sensor, wherein the at least one voicing sensor detects human tissue vibration associated with voicing activity of a user, wherein an absence of voiced information voicing activity is detected during a period using the at least one voicing sensor (see fig. 5 (43) and see col. 15 line 29-col. 16 line 3 and col. 60 line 19-30)

Therefore, it would have obvious to one of ordinary skill in the art the time the invention was made to combine the teaching of Holizrichter into Yoshida to produce more accurate speech coding.

Consider claim 35 as base on 112 first paragraph problem state above, Yoshida teaches a signal processing system coupled among a user and an electronic device(see fig.4), wherein the signal processing system (20,300) includes a denoising subsystem (20) for removing acoustic noise from acoustic signals, the denoising subsystem comprising a processor(300) coupled among a receiver and at least one sensor, wherein the receiver is coupled to receive at the acoustic signals via at least two microphones, wherein the processor (300) generates a plurality of transfer functions, wherein a first transfer function representative of the a ratio of acoustic energy received by the two microphones (1,2) is generated in response to a determination that voicing activity is absent from the acoustic signals for one a specified period of time, wherein acoustic noise is removed from the acoustic signals using the first transfer function to produce a denoised acoustic data stream (see figs.4-5 and 8 and see col. 7 line 59-64, col. 7 line 59-64 and col. 8 line 1-col. 9 line 67, col. 11 line 50-col. 12 line 12); but

Yoshida does not explicitly teach the at least one sensor detects human tissue vibration associated with human voicing activity of a user.

However, Holzrichter teaches the at least one sensor detects human tissue vibration associated with human voicing activity of a user (see fig. 5 (43) and see col. 15 line 29-col. 16 line 3 and col. 60 line 19-30)

Therefore, it would have obvious to one of ordinary skill in the art the time the invention was made to combine the teaching of Holizrichter into Yoshida to produce more accurate speech coding.

Consider claim 36, Yoshida teaches the system, wherein a second transfer function representative of the acoustic signals is generated in response to a determination that voicing activity is present in the acoustic signals for a specified period of time, wherein acoustic noise is removed from the acoustic signal signals using at least one combination of the first transfer function and the second transfer function to produce a denoised acoustic data stream(see figs.4-5 and 8 and see col. 7 line 59-64, col. 7 line 59-64 and col. 8 line 1-col. 9 line 67, col. 11 line 50-col. 12 line 12).

Consider claim 37, Yoshida as modified by Holzrichter teaches that the system of the at least one electronic device includes at least one of cellular telephones, personal digital assistants, portable communication devices, computers, video cameras, digital cameras, and telematics systems (in Holzrichter, see col. 16 line 51-67).

Consider claim 39, Yoshida teaches a computer readable medium comprising executable instructions which, when executed in a processing system, remove acoustic noise from received acoustic signals by (see fig. 4):

receiving at least one two acoustic (see fig.4 (1,2));

generating a first transfer function representative of a ratio of energy of the acoustic signals upon determining that voicing activity is absent from the at least two acoustic signals for a specified period of time(300); and

removing the acoustic noise from the at least one two acoustic signals using the first transfer function to produce at least one denoised acoustic data stream (see figs.4-5 and 8 and see col. 7 line 59-64, col. 7 line 59-64 and col. 8 line 1-col. 9 line 67, col. 11 line 50-col. 12 line 12); but Yoshida does not explicitly teach receiving human tissue vibration information associated with human voicing activity of a user.

However, Holzrichter teaches receiving human tissue vibration information associated with human voicing activity of a user (see fig. 5 (43) and see col. 15 line 29-col. 16 line 3 and col. 60 line 19-30)

Therefore, it would have obvious to one of ordinary skill in the art the time the invention was made to combine the teaching of Holizrichter into Yoshida to produce more accurate speech coding.

Consider claim 40, Yoshida teaches removing the acoustic noise from received acoustic signals further includes:

generating a second transfer function representative of the at least one two acoustic signals upon determining that voicing activity is present in the at least two acoustic signals for the specified period of time; and removing acoustic noise from the at least two acoustic signals using at least one combination of the first transfer function and the second transfer function to produce the at least one denoised acoustic data stream

(see figs.4-5 and 8 and see col. 7 line 59-64, col. 7 line 59-64 and col. 8 line 1-col. 9 line 67, col. 11 line 50-col. 12 line 12).

12. Claims 31 and 45-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshida et al (US PAT. 5,473,702) as modified by Holzrichter (US PAT. 5,729,694) as applied to claims 1, 12 and 26 above, and further in view of Cezanne et al. (US PAT. 5,473,701).

Consider claim 31, Yoshida as modified by Holzrichter does not explicitly teach the system further comprising: dividing acoustic data of the acoustic signals into a plurality of subbands; generating a transfer function representative of the ratio of acoustic energies received in each microphone in each subband; removing acoustic noise from each of the plurality of subbands using a transfer function, wherein a plurality of denoised acoustic data streams are generated; and combining the plurality of denoised acoustic data streams to generate the at denoised acoustic data stream.

However, Cezanne teaches the system further comprising:

dividing acoustic data of the acoustic signals into a plurality of subbands (see fig. 3, fig. 7);

generating a transfer function representative of the ratio of acoustic energies received in each microphone in each subband(see abstract);

removing acoustic noise from each of the plurality of subbands using a transfer function, wherein a plurality of denoised acoustic data streams are generated; and

combining the plurality of denoised acoustic data streams to generate the at denoised acoustic data stream (see col. 5 line 35-col. 6 line 50 and col.7 line 46-col.8 line 23).

Therefore, it would have obvious to one of ordinary skill in the art the time the invention was made to combine the teaching of Cezanne into the teaching of Holizrichter and Yoshida to provide a desirable level of noise rejection, they may be of limited usefulness in situations where noise sources move in relation to the array.

Consider claims 45-46, they are essentially similar to claim 31 and are rejected for the reason stated above apropos to claim 31.

Response to Arguments

13. Applicant's arguments with respect to claim1-3, 6-13, 15-17, 21-22, 26-41 and 45-46 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

14. The prior art made of record and not relied upon is considered to applicant's disclosure. Park (US PAT. 5,590,241) is recited to show other related the voice activity detector (VAD) based multiple-microphone acoustic noise suppression.

15. Any response to this action should be mailed to:

Mail Stop ____(explanation, e.g., Amendment or After-final, etc.)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450
Facsimile responses should be faxed to:

(571) 273-8300
Hand-delivered responses should be brought to:
Customer Service Window
Randolph Building
401 Dulany Street
Alexandria, VA 22314

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lao,Lun-See whose telephone number is (571) 272-7501 The examiner can normally be reached on Monday-Friday from 8:00 to 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian Chin, can be reached on (571) 272-7848.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 whose telephone number is (571) 272-2600.

Lao,Lun-See
/LUN-SEE LAO/
Examiner, Art Unit 2615
Patent Examiner
US Patent and Trademark Office
Knox
571-272-7501
Date 07-05-2008

/Vivian Chin/
Supervisory Patent Examiner, Art Unit 2615